

Title: Life Without Chocolate?

Brief Overview:

Students will research the rain forest and discover the destruction and its impact on the loss of cocoa. They will be asked to help conserve the rain forest by making chocolate chip cookie bars and by designing packages to sell to consumers.

Links to NCTM Standards:

- **Mathematics as Problem Solving**

Students will be working toward a solution for the rain forest by applying their knowledge of fractions, using strategies to solve mathematical situations, writing to inform, and making decisions regarding their advertisement.

- **Mathematics as Communication**

Students will explain understanding of the concept of fractions in their journals. They also will make oral presentations of the strategies they used during the cookie bar making process.

- **Mathematics as Reasoning**

Students will share the strategies they used to determine the solutions they chose during the making of the cookie bars and the advertisement bags.

- **Mathematical Connections**

Students will research the rain forest by using textual resources or the Internet. They will write to inform consumers about the destruction of the cocoa trees in the rain forest via a packaging advertisement. Students will make a connection to Social Studies by exploring the products and animal life of the rain forest environment through literature.

- **Estimation**

Students will demonstrate their ability to apply estimation strategies when they discuss with their group the number of cups and teaspoons the students think will be needed in the recipe.

- **Number Sense and Numeration**

Students will use their knowledge of fractions when following a recipe with limited measuring tools and creating their advertisement bag.

- **Measurement**

Students will demonstrate and apply concepts of measurement using customary units. They will estimate and verify measurement in their chocolate chip cookie bar recipe. They will apply measurement to interdisciplinary and real-world problem-solving situations when creating the cookie bars.

- **Statistics**

Students will demonstrate their ability to collect, organize, and display information in pictograph form. Students will interpret the most missed rain forest products from the class generated display.

- **Fractions and Decimals**

Students will demonstrate and apply concepts of fractions to find equivalent fractions when only given a $\frac{1}{4}$ cup and $\frac{1}{4}$ teaspoon to create a chocolate chip cookie bar recipe which requires larger fractions. Students will be required to use their fraction knowledge when designing their advertisement bag.

Grade/Level:

Grade 3 (many ideas can be adapted for second grade)

Duration/ Length:

4 to 5 class days (variable)

Prerequisite Knowledge:

Students should have working knowledge of the following skills:

- Basic knowledge of fractions
- Equivalent fractions
- Adding fractions

Objectives:

Students will demonstrate the ability to:

- name equivalent fractions by using measuring tools.
- add fractions by using measuring tools.
- explain their thinking process during the creation of the recipe through a journal.
- show their basic knowledge of fractions by using specified criteria to create an advertisement bag.
- write to inform about rain forest destruction by using information gathered from textual resources.
- collect, organize, display, and interpret information in pictograph form.

Materials/Resources/Printed Materials:

Day 1:

- The Great Kapok Tree by Lynne Cherry
- Chart paper
- Math journals
- Animal web (Student Resource Sheet 1)
- Homework (Student Resource Sheet 2)
- Large brown paper bag containing as many of these items as possible
- Rubber eraser, stick of chewing gum, chocolate bar, coffee, cashew nuts, cinnamon, nutmeg, sugar, cola, pineapple, kiwi, lime, lemon, mango

Day 2:

- Designing Your Bag (Student Resource Sheet 3) and teacher transparency
- Colored pencils or crayons (provided by each student)
- Lunch bag for each student
- Previous night's homework (Student Resource Sheet 2)

- One post it note for each student
- Transparency of Designing Your Bag - student example (Teacher Resource Sheet 1)

Day 3:

- Resources within your school for researching how the rain forest is being destroyed (Internet, encyclopedias, media books, videos, etc.)
- Note to Consumers (Student Resource Sheet 4) and teacher transparency
- Note taking sheet (Student Resource Sheet 5)
- Cookie Bar Recipe (Transparency of Teacher Resource Sheet 2)
- Writing Prompt (Transparency of Teacher Resource Sheet 3)
- Math journal
- Homework (advertisement bag) from Day 2
- Ingredients for chocolate chip cookie bars:
 - 2 sticks of butter
 - 3/4 cup brown sugar
 - 2 eggs
 - 1 teaspoon baking soda
 - 2 cups chocolate chips
 - 3/4 cup granulated sugar
 - 1 teaspoon vanilla extract
 - 2 1/4 cups flour
 - 1/2 teaspoon salt
- Materials for recipe:
 - Bowl
 - Spoon
 - Electric mixer
 - 1/4 measuring cup (Do not include larger measuring cups so that the students can complete the conversations.)
 - 1/4 teaspoon (Do not include larger teaspoons so that the students can complete the conversations.)
 - Jelly roll pan
 - Oven
 - Knife

Day 4:

- Resources within your school for researching how the rain forest is being destroyed (Internet, encyclopedias, media books, videos, etc.)
- Note Taking Sheet (Student Resource Sheet 5)
- Baked cookie bars
- Decorated bags
- Note to Consumers (Student Resource Sheet 4), for final draft
- Glue or stapler

Development/Procedures:

Day 1:

- Read The Great Kapok Tree by Lynne Cherry orally to the students. Be sure to show the students the map on the inside cover to show rain forest locations.
- Lead a discussion about the importance of the rain forest.

- Revisit the illustrations to identify the animals in the rain forest. Be sure to share with the students the following information: Rain forests cover less than 2% of the Earth's surface, yet they are home to some 50 to 70% of all life forms on our planet.
 - Using the chart paper and Animal Web (Student Resource Sheet 1), web the animals of the rain forest.
 - Bring out the large brown bag containing the objects and explain to the students that they are now going to learn about the products made from the resources of the rain forest.
 - Choose student volunteers one at a time to reach into the bag and choose an item. By feeling the item inside the bag, the student will describe the object to his/her classmates. As a class the students will predict what the item is. The student volunteer will reveal the item to the class.
 - Lead a discussion about how each of the items come from the rain forest.
(rubber eraser and stick of chewing gum from a rubber tree; chocolate bar from a cocoa tree; coffee from coffee beans; cashew nuts from a cashew nut tree; cinnamon from bark of cinnamon and cassia trees; nutmeg from a nutmeg tree; sugar from sugar cane; cola from a major ingredient, the kola nut; pineapple from a pineapple plant; kiwi from a kiwi plant; lime and lemon from lime and lemon trees; mango from a mango tree)
 - Revisit the map just inside the front cover of The Great Kapok Tree by Lynne Cherry to lead your discussion on rain forest destruction. You may want to include the following global statistics:
 - 2.47 acres are destroyed per second: equivalent to two U.S. football fields;
 - 150 acres per minute;
 - 214,000 acres per day: an area larger than New York City;
 - 78 million acres per year: an area larger than Poland;
 - An average of 137 species of life forms are driven into extinction every day or 50,000 each year; and
 - Nearly 80-90% of tropical rain forests will be destroyed by the year 2020.
 - Closure: Have the students tell a partner two things they learned about the rain forest from today's discussion and share two reasons why it is important to conserve (save) the rain forest.
 - Journal Entry: Now that you have shared what you learned about the rain forest with your partner, write at least 2 sentences explaining the importance of conserving the rain forest. In addition, include at least 1 sentence which explains an idea you may have for making others aware of the destruction of the rain forest.
- Homework: Student Resource Sheet 2

Day 2:

- Have students use a post it note to draw a picture and label the product that they would miss the most using the previous night's homework. The class will construct a class pictograph, on the chalkboard, using the notes to show the most missed products. (Hopefully, chocolate!)
- Using the ideas the students wrote in the previous day's journal about rain forest conservation, lead the students into a discussion about the correlation between the destruction of cocoa trees and the future status of chocolate supply (our most missed product from our class graph).
- Continue the discussion with students about a product they could make using chocolate and a way to package the product to raise consumer awareness about the destruction of the cocoa trees in the rain forest. (During this discussion lead the students toward making chocolate chip cookie bars and packaging them in lunch bags.)
- Brainstorm with the students criteria that should be included in the design of their advertisement bag. Students will record criteria on Designing Your Bag (Student Resource Sheet 3) while teacher records on overhead.

Examples of exemplary bag criteria:

- title provides information about rain forest destruction
- colorful and bright packaging
- 1/4 of the bag should include location of rain forests in the world
- 1/4 of the bag should include the rain forests' worst enemy
- 1/2 of the bag should include drawings with labels of animals and products found in the rain forest

- Display transparency of Designing Your Bag - student example (Teacher Resource Sheet 1) and evaluate whether the student met class generated criteria. Discuss how the student example could have received an exemplary score.
- Students will complete Designing Your Bag (Student Resource Sheet 3).
- Students will evaluate their own bag using the criteria. Then they will have a boy and a girl also evaluate their bag using the criteria. At this time evaluate each students rough draft.
- Closure: Students will share with a partner how their knowledge of fractions helped them to design their advertisement bag.
- Homework: Provide each student with a lunch bag to complete their final draft of their advertisement bag using Designing Your Bag (Student Resource Sheet 3).

Day 3:

- Display transparency of Cookie Bar recipe (Teacher Resource Sheet 2). Inform students that you only have 1/4 measuring cup and 1/4 teaspoon (you left the rest at home). Tell the students the class will need to complete the recipe the following day unless they can solve the dilemma. Have them use T-P-S to discuss strategies they could use to still make the cookie bars. Students will first estimate their recipe conversions in their math journals. Then students will write and explain their conversion strategy for each ingredient involving fractions in their math journal. Evaluate students' journals.
- Using student volunteers make the cookie bars with the class using only 1/4 cup and 1/4 teaspoon. Have students verbalize the math strategies to the class during the cookie bar making process.
- Introduce transparency of Writing Prompt (Teacher Resource Sheet 3) while cookie bars are baking. Use the writing prompt to brainstorm criteria for the students' note to the consumer. Students will record the criteria on Note to Consumers sheet (Student Resource Sheet 4) while the teacher records on a transparency. Suggestion: Teacher may want to run this sheet back to back for additional writing space.

Examples of exemplary note criteria:

- Explain why the class made the cookies.
- Explain the connection between the chocolate supply and the rain forest destruction
- Explain how the rain forest is being destroyed
- Explain why it is important to conserve the rain forest
- Use correct capitalization, punctuation, spelling, and grammar
- Sentences are clear and complete
- Students will use resources to research information needed for the writing prompt. Students will take notes on Note Taking sheet (Student Resource Sheet 5).
- Closure: Students will share with a partner what they learned about how the rain forest is being destroyed from their research.

Day 4:

- Students complete rough drafts. Students will evaluate their own note using the criteria. Then they will have a boy and a girl also evaluate their note using the criteria.
- Students complete final draft on Note to Consumers sheet (Student Resource Sheet 4).

- Evaluate student project.

Rubric:

3 points:

- all class generated criteria was met
- few errors in capitalization, punctuation, spelling, and grammar
- all sentences were clear and complete thoughts

2 points:

- most class generated criteria was met
- some errors in capitalization, punctuation, spelling, and grammar
- most sentences were clear and complete thoughts

1 point:

- some class generated criteria was met
- many errors in capitalization, punctuation, spelling, and grammar
- few sentences were clear and complete thoughts

- Students add cookie bars to their bags.
- Students will complete a gallery walk. Students will place their bags on their desk. Each student will walk around and look at their classmates' work as a display for all the final products.

Performance Assessment:

Ongoing assessment is by teacher observation, completion of student resource sheets, and journal writing. Final performance assessment evaluates student created projects according to the rubric developed from the student generated criteria. You may utilize the rubric included with this learning unit as your assessment tool.

Extension/Follow Up:

- Related Internet sites:

Rain forest web sites

Science in the Rain Forest

www.pbs.org

Rain Forest Alliance

www.rainforest-alliance.org

The Rain Forest Company

www.the-rainforest-co.com

Rain Forest Action Network

www.ran.org

Candy web sites

Candy Manufacturers Association

www.candyusa.org

Hershey Food Corporation

www.hersheys.com

Mexican Hot

www.mexconnect.com

M&M's

www.m-m's.com

Nestle The World Food Company

www.nestle.com

- Economics study -
 - Sell cookie bars to student body to raise money to send to a rain forest organization.
 - Research cost of materials needed to create cookie bars (using store advertisements), determine profit or loss.
- Conduct further research of the rain forest.

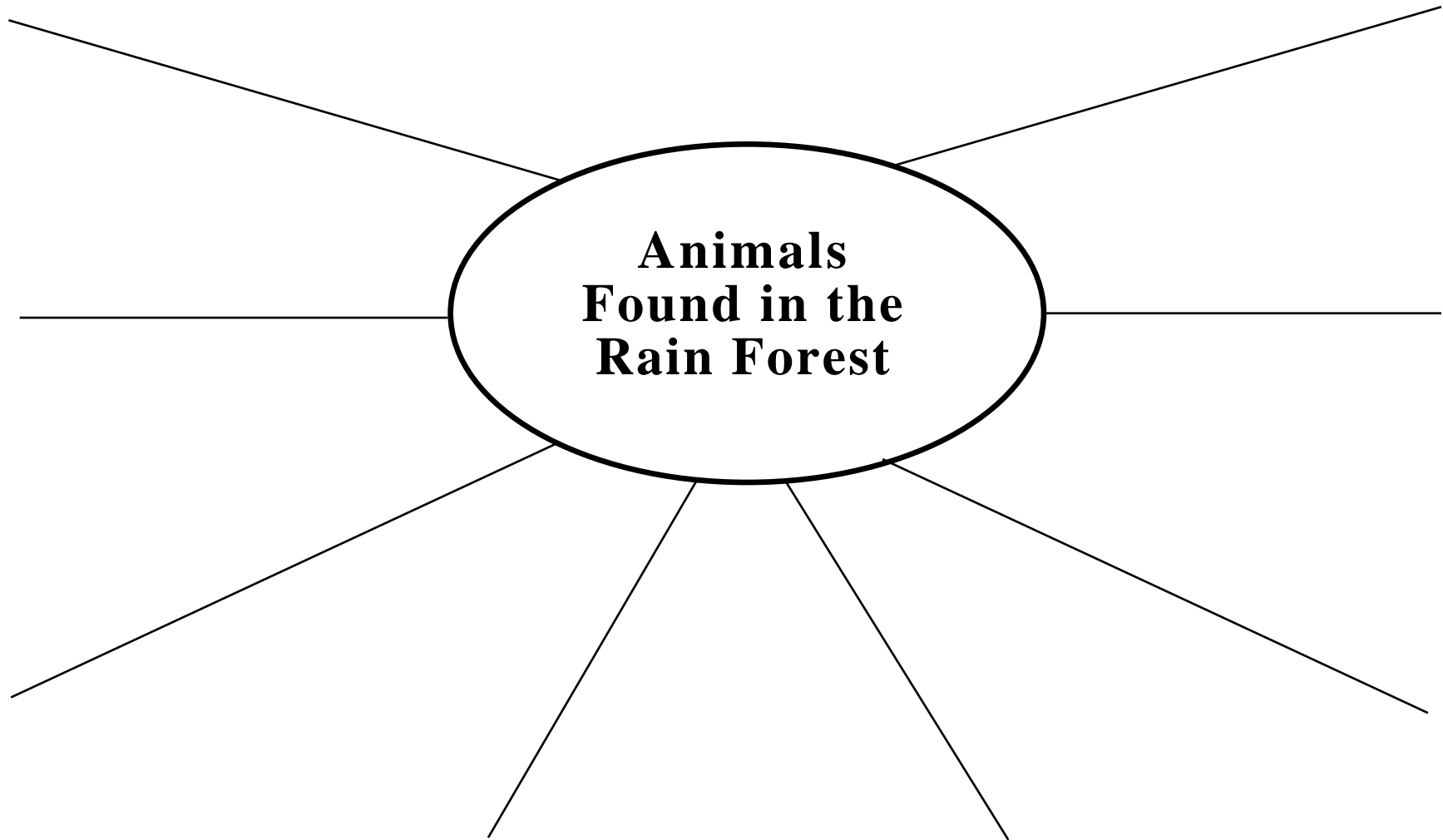
Authors:

Jen McGraw
Perry Hall Elementary School
Baltimore County, MD

Laura Raab
Northfield Elementary School
Howard County, MD

The Great Kapok Tree- Web

Student Resource Sheet 1



Journal Response

Today you learned about several products made from resources found in the rain forest. Choose the product that you would miss the most if rain forest destruction continued. Write a note to your teacher informing him or her of the product you chose and why you would miss that product the most. Be sure to explain how life would be different without this product.

This image shows a single sheet of white paper with horizontal blue ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

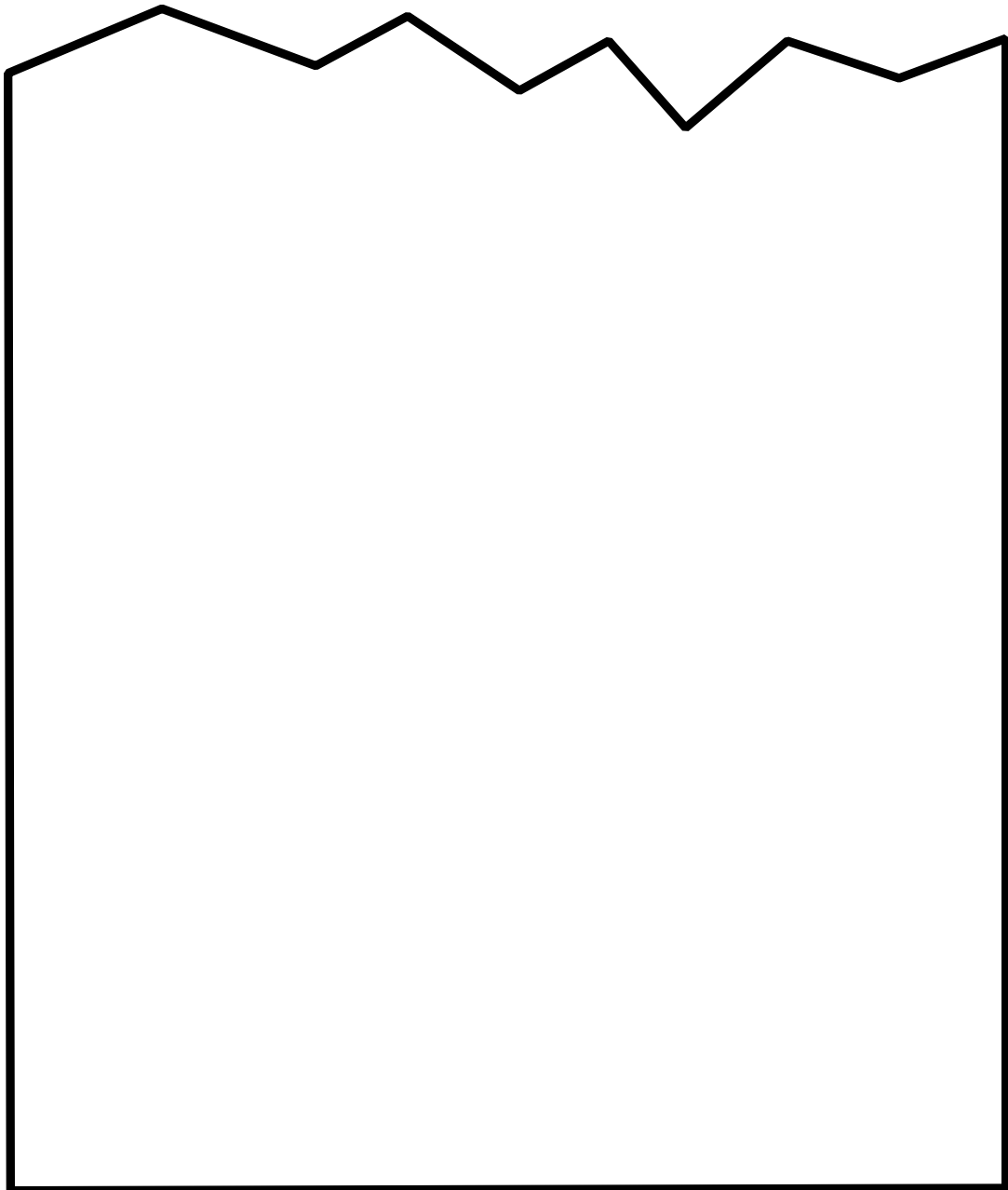
Designing Your Bag

Remember when you design your bag, you will need to:

☐ ☐ ☐ _____ ☐ ☐ ☐ _____

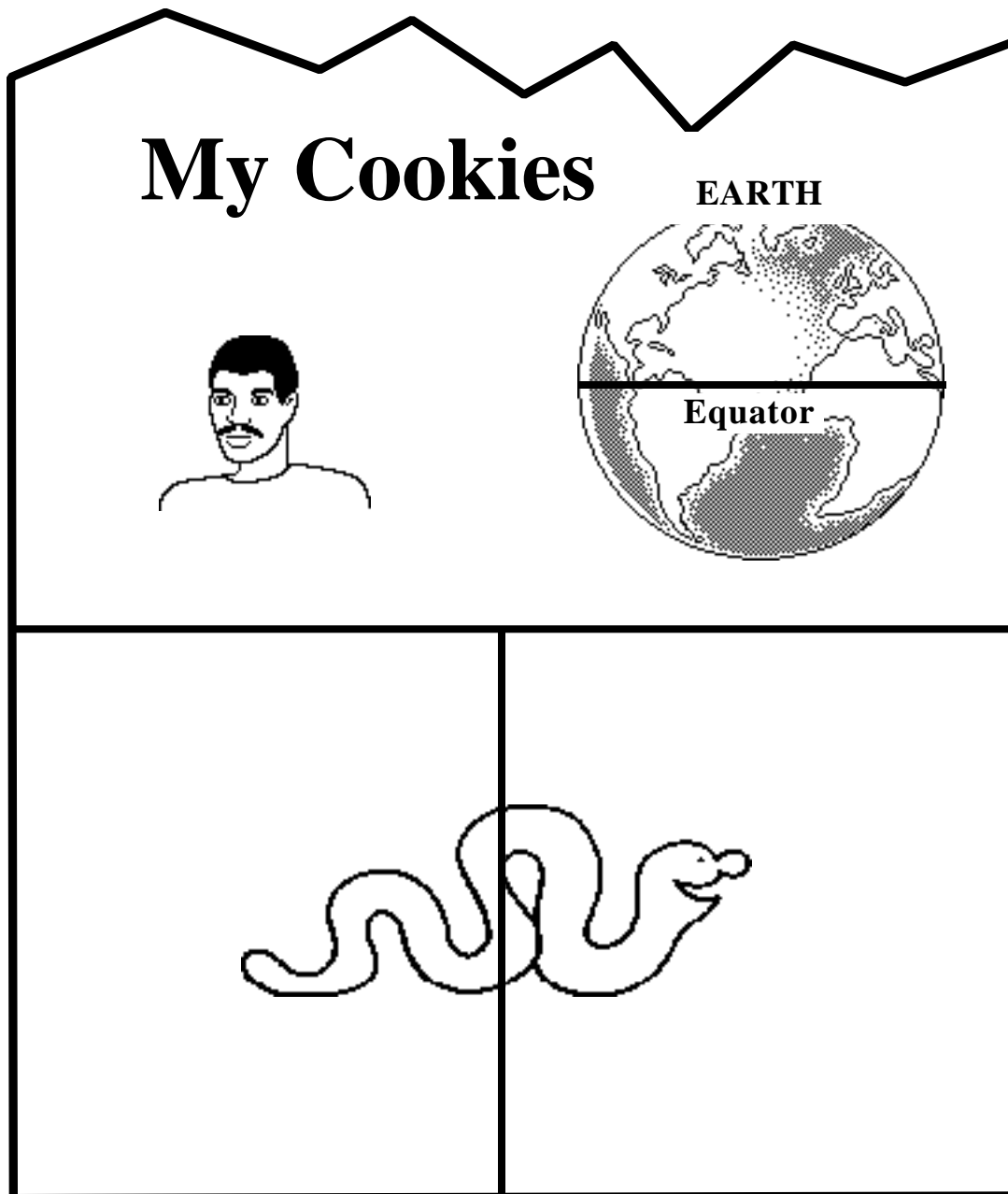
☐ ☐ ☐ _____ ☐ ☐ ☐ _____

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Designing Your Bag

Student Example





Chocolate Chip Cookies

Ingredients:

1 cup (2 sticks) of butter, softened	3/4 cup granulated sugar
3/4 cup packed brown sugar	1 teaspoon vanilla extract
2 eggs	2 1/4 cup all-purpose flour
1 teaspoon baking soda	1/2 teaspoon salt
2 cups (11.5 oz. pkg.) Chocolate Chips	1 cup chopped nuts (optional)

Instructions

1) Heat oven to 375°F. 2) In a large bowl, beat butter, granulated sugar, brown sugar, and vanilla with electric mixer until it is creamy. Add eggs; beat well. Stir together flour baking soda and salt; slowly add to butter mixture, beating until well blended. Stir in chocolate chips and nuts, if desired. Drop by teaspoonfuls onto an ungreased cookie sheet. 3) Bake 8 to 10 minutes until lightly browned. Cool slightly; remove from cookie sheet to wire rack. Then let cookies cool completely. *Makes about 5 dozen cookies*

Pan Recipe: Spread batter into greased 15 1/2 x 10 1/2 jelly roll pan. Bake at 375°F 20 minutes until lightly browned. Cool completely in pan on wire rack. Cut into bars. *Makes about 48 bars*

Prep Time: 25 minutes Start to Finish: 1 hr. 10 min.

Note To Consumers Writing Prompt

Now that you have learned about rain forest destruction and completed your illustrations on your advertisement bags, you need to write a note to consumers to inform them of why our class made the chocolate chip cookie bars.

In your note you will need to explain the connection between the rain forest destruction and the future of the world's chocolate supply. Be sure to include how the rain forest is being destroyed and why it is so important to conserve the remaining rain forests. Since this note will be read by consumers, remember to proofread your writing for correct capitalization, punctuation, spelling, and grammar. You will also need to make sure that your sentences are clear and complete. Now begin your note to consumers informing them of why our class made the chocolate chip cookie bars.

F _____

A _____

T _____

P _____

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Notetaking: Destruction of the Rain Forest

Notetaking Criteria

Evaluation		Evaluation	
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<input type="checkbox"/>		<input type="checkbox"/>	
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